# SUDDEN LOSS OF VISION AND EMERGENCIES

Division of Ophthalmology UCT

# REFERRAL

- All causes of sudden loss of vision are serious and require referral
- Most causes of sudden loss of vision have an associated systemic disease

# *TRANSIENT* VISUAL LOSS LASTING < 24 HOURS

- Few ***seconds*** (usually bilateral) – exclude papilloedema

  **Optic disc swelling**

- Few ***minutes*** (usually unilateral) – amaurosis fugax (TIA)

  **Carotid / cardiac disease / Giant cell arteritis. Fundus may be normal**
  **Urgent ‘stroke’ workup**

- 15-30 ***minutes*** (bilateral)– migraine aura

  **Normal ocular examination**

- Refer as appropriate for investigation

# SUDDEN *SUSTAINED* VISUAL LOSS LASTING > 24 HOURS

- Painless
  - Retinal detachment
  - Retinal artery or vein occlusion
  - Ischaemic optic neuropathy
  - Vitreous haemorrhage
  - Cerebrovascular event (hemi-anopia)
- Painful (with red eye)
  - Acute angle-closure glaucoma
  - Keratitis / corneal hydrops (keratoconus)
  - Uveitis / endophthalmitis
  - Trauma
- Painful (without red eye)
  - Optic neuritis (pain with eye movements)

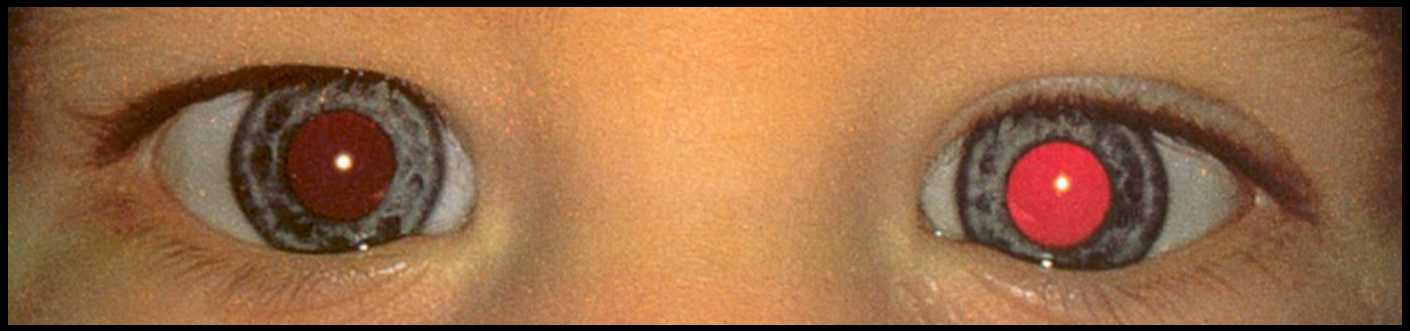
# SUDDEN PAINLESS VISUAL LOSS

**Signs you must know!**

**Could have RAPD depending on cause**

| | | RAPD + | RAPD - |
|---|---|---|---|
| **Abnormal red reflex** | Yes | Retinal detachment | Vitreous haemorrhage |
| | No | Ischaemic optic neuropathy<br><br>Retinal artery or vein occlusion | Cerebrovascular event (hemi-anopia) |

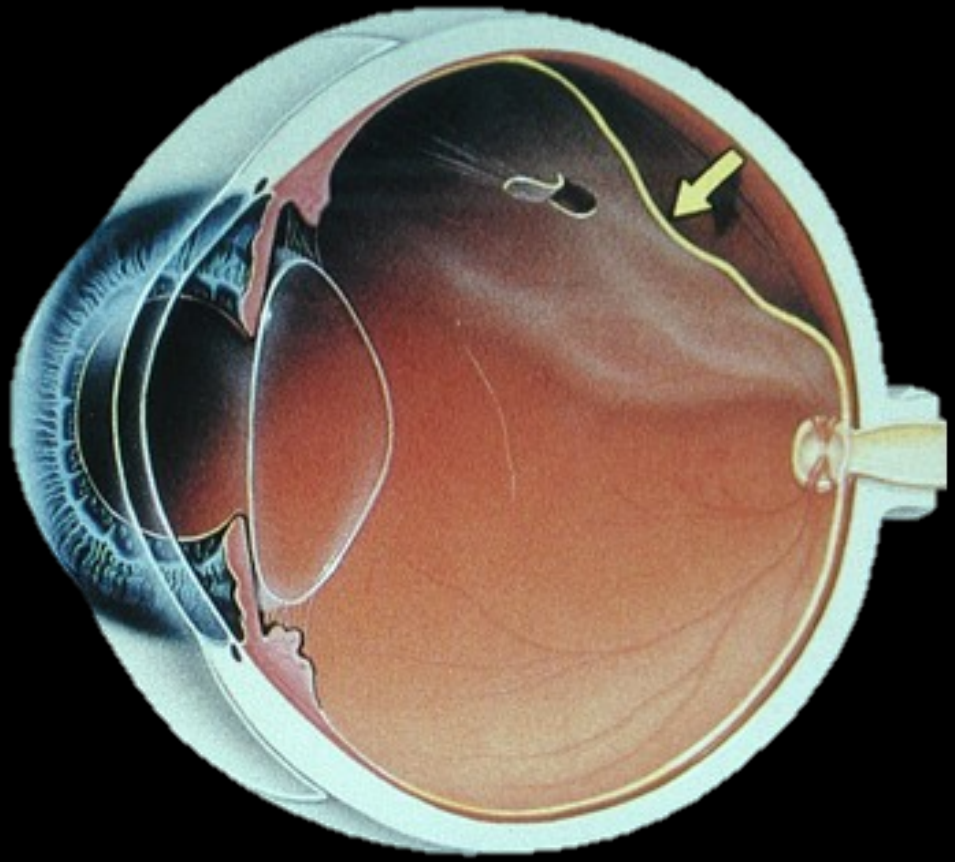
**Why visual field testing is so important!**



| | RAPD | |
|---|---|---|
| | + | - |
| **Abnormal red reflex** | Retinal detachment | Vitreous haemorrhage with good retinal function |

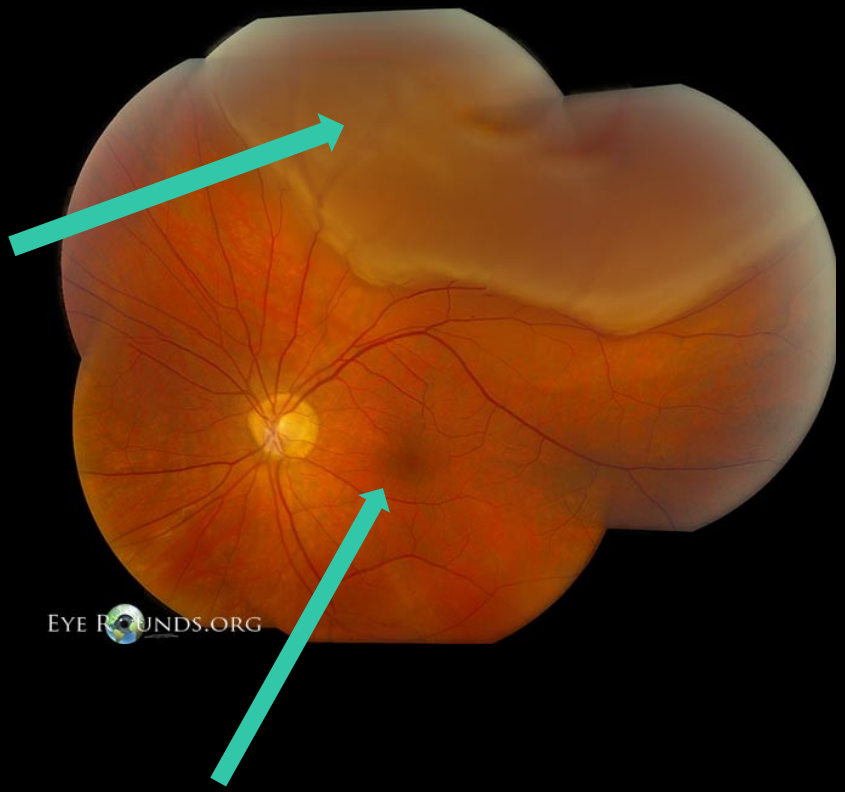
**Diabetic with vitreous haemorrhage? = Proliferative diabetic retinopathy**

# RETINAL DETACHMENT



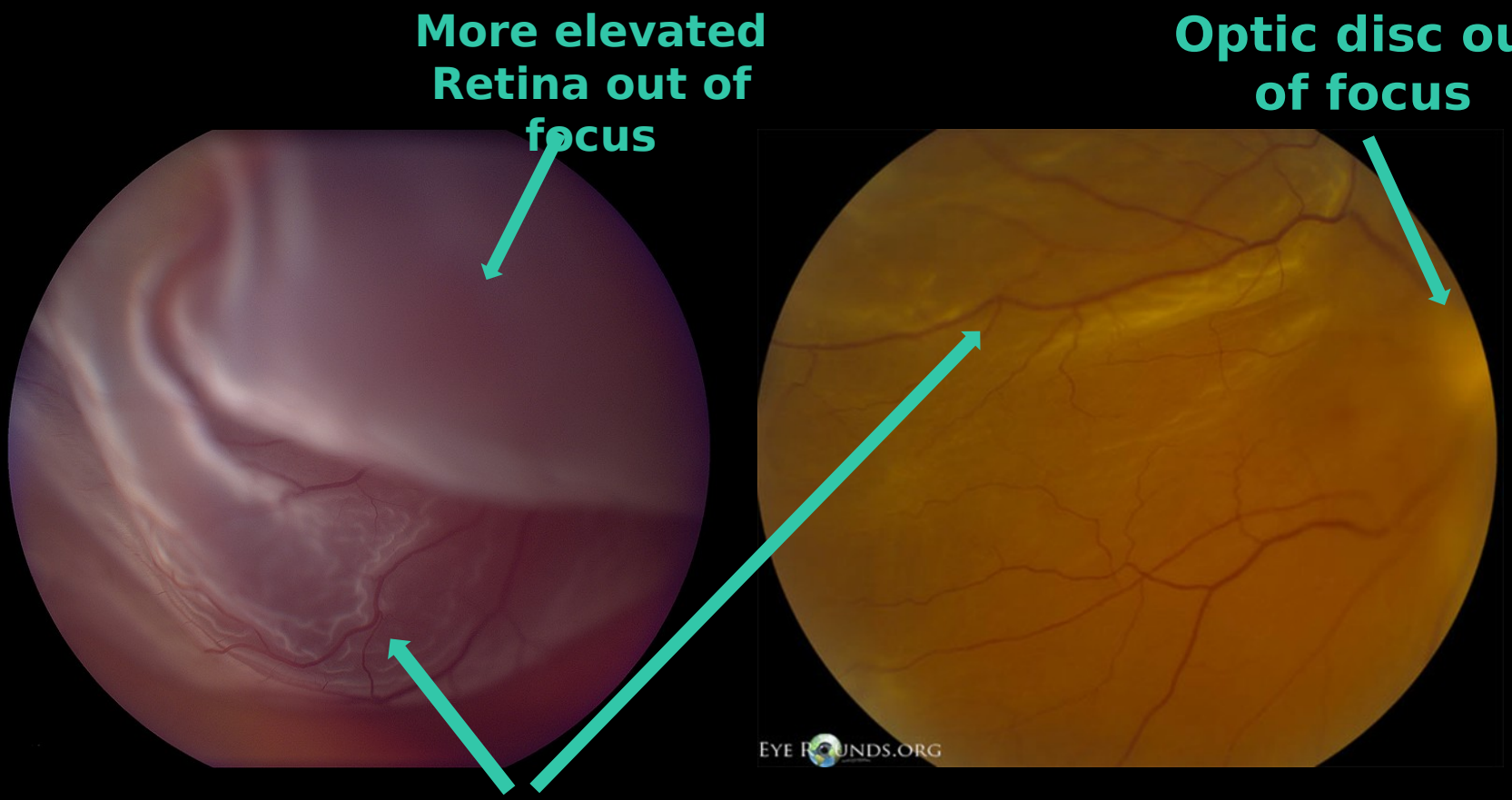
# RETINAL DETACHMENT

- History of ‘flashes and floaters’ (earliest symptom - **refer urgently before field defect**)
- Painless loss of vision that started as a shadow in the peripheral field
- ‘Abnormal’ red reflex compared to the normal eye (paler or duller)
- RAPD + with larger detachment




**Macula still ‘attached’ = Good central vision = emergency**

# RETINAL DETACHMENT



# CENTRAL RETINAL ARTERY OCCLUSION

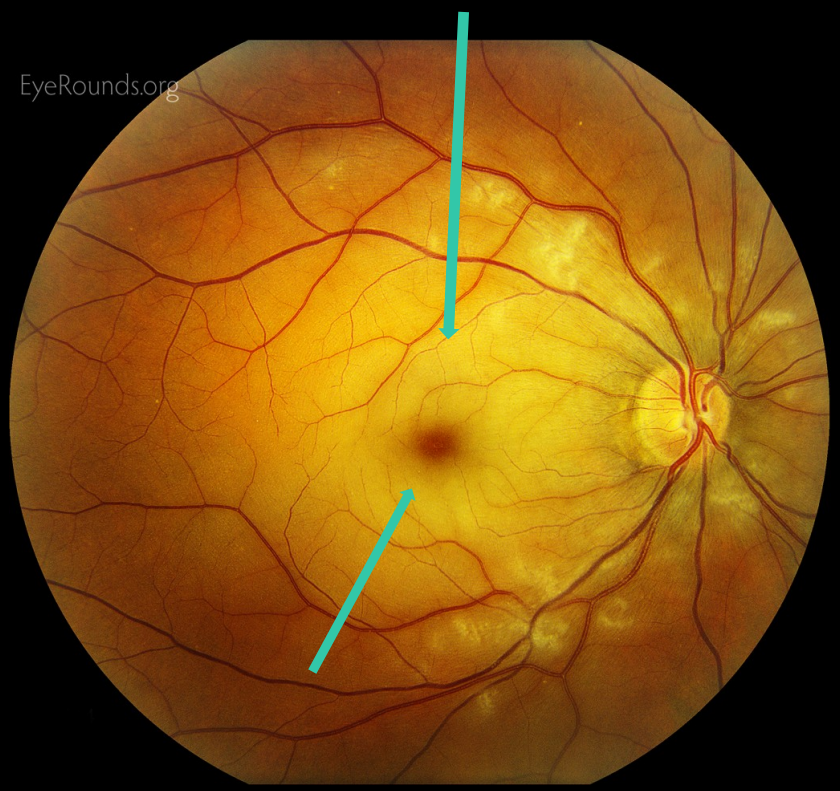
- Sudden severe visual loss
- RAPD +
- Normal red reflex

- Urgent management if < 24 hours old
  - **Try and reduce eye pressure**
    - **Ocular massage**
    - **Diamox 500 mg PO**
  - **Refer urgently**

- Needs urgent “stroke” workup
- Exclude Giant Cell Arteritis

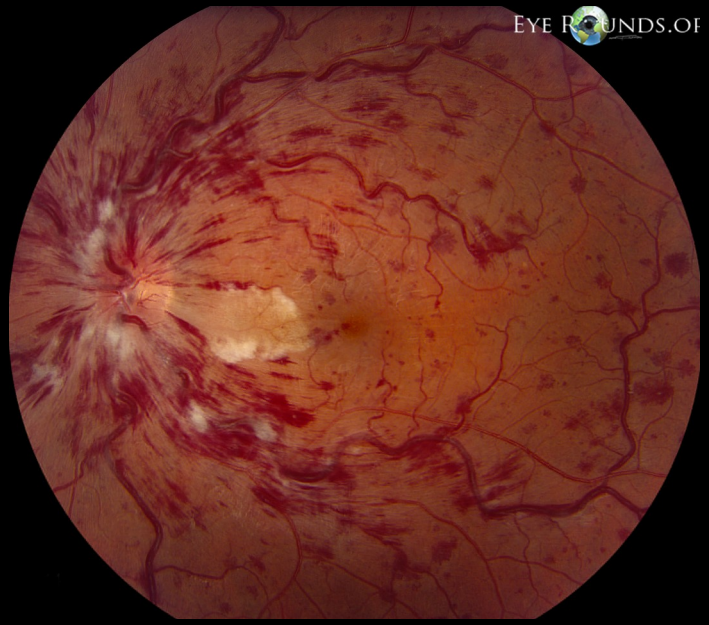
- If CRAO older than 24 hours
  - ophthalmology within days

**Swollen, pale retina**

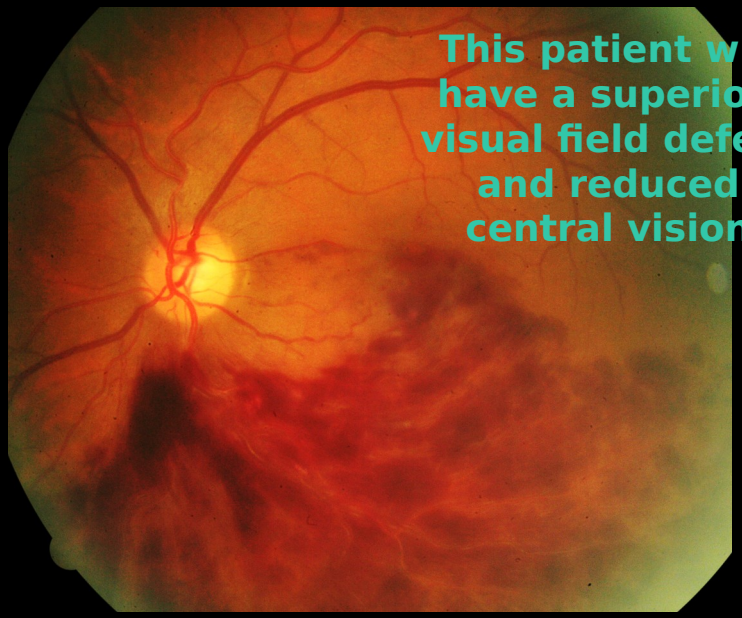



**‘Cherry-red spot’ is the thin fovea surrounded by swollen retina**

# RETINAL VEIN OCCLUSIONS



Central retinal vein occlusion




Branch retinal vein occlusion

**These patients are usually > 50 years and have poorly controlled cardiovascular risk factors, particularly hypertension**

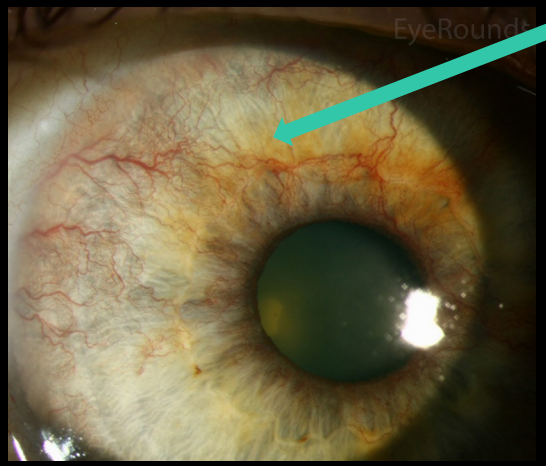
# COMPLICATIONS OF VASCULAR OCCLUSION IN THE EYE

Vein and artery occlusions cause sudden loss of vision

= AN ISCAEMIC EVENT = VEGF production

They can lead to:

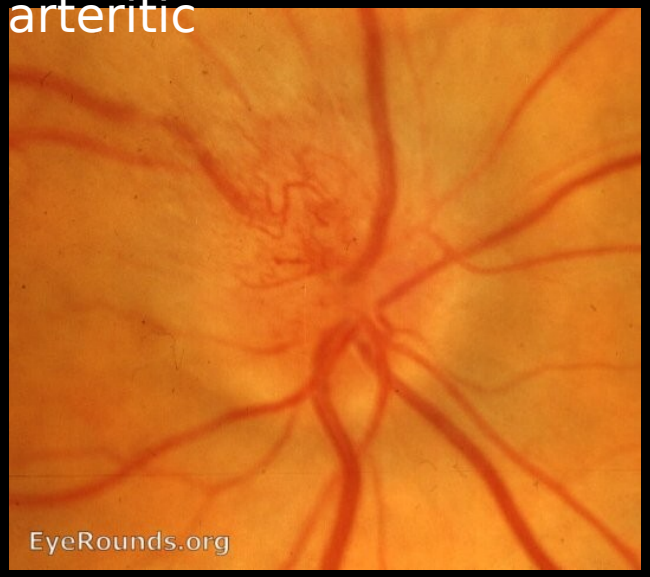
- Neovascularisation of the disc, retina and Iris
- Vitreous haemorrhage
- Neovascular glaucoma

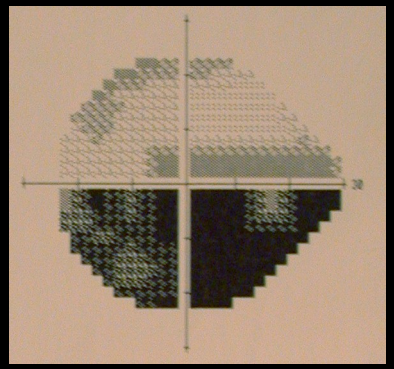



**Note the iris new vessels**
**These can be seen with the direct ophthalmoscope used as a 'magnifying glass' (high 'Green' numbers on the dial)**

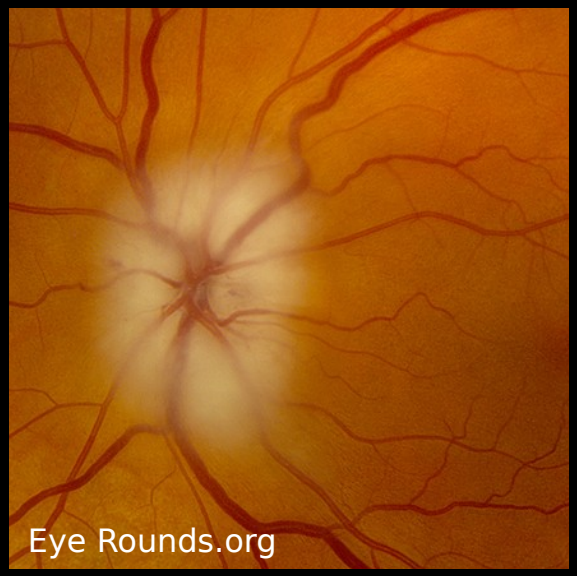
# ANTERIOR ISCHAEMIC OPTIC NEUROPATHY – SWOLLEN DISC

Non-arteritic



Arteritic (Giant Cell Arteritis)




**Disc swelling – altitudinal field loss**

**More severe visual loss. Paler swelling**

**Assessment and management of systemic risk factors and exclusion of GCA are most important**

# GIANT CELL (TEMPORAL) ARTERITIS

**Most common eye complication**

- Anterior ischaemic optic neuropathy **Swollen disc**
- Central retinal artery occlusion **Cherry red spot**
- Cranial nerve palsies

**<u>Both eyes can be blind in days!</u>**

- 50+ year old
- New onset headache
- Malaise
- Loss of appetite
- Loss of weight
- Scalp tenderness
- Jaw claudication
- Limb girdle aches & pains

# MANAGEMENT OF GIANT CELL ARTERITIS

- Do urgent ESR & CRP & platelets
- If suspect diagnosis
  - Refer same day to ophthalmologist for admission and IV methylprednisolone 250mg qid x 3 days
  - Needs **temporal artery biopsy** within 10 days to confirm Dx
  - Managed with long term immunosuppression
- If referral delayed
  - Give patient Prednisone 1-2mg/kg (60-120 mg p.o. for most patients) while awaiting transfer
- Emerging investigation – vascular **ultrasound**

# SWOLLEN DISC(S)

Urgent referral

- Bilateral
- Good vision
- May have transient visual loss (seconds)

↓

- **Papilloedema**

- Unilateral
- Sustained visual loss

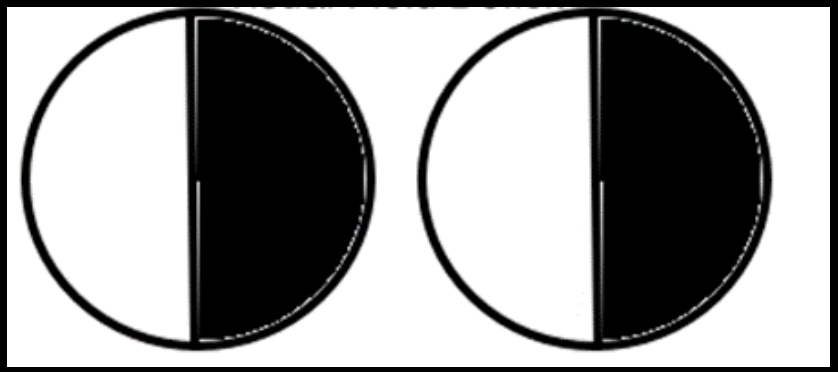
↓

- **Anterior ischaemic optic neuropathy (AION)**
- **Optic neuritis**

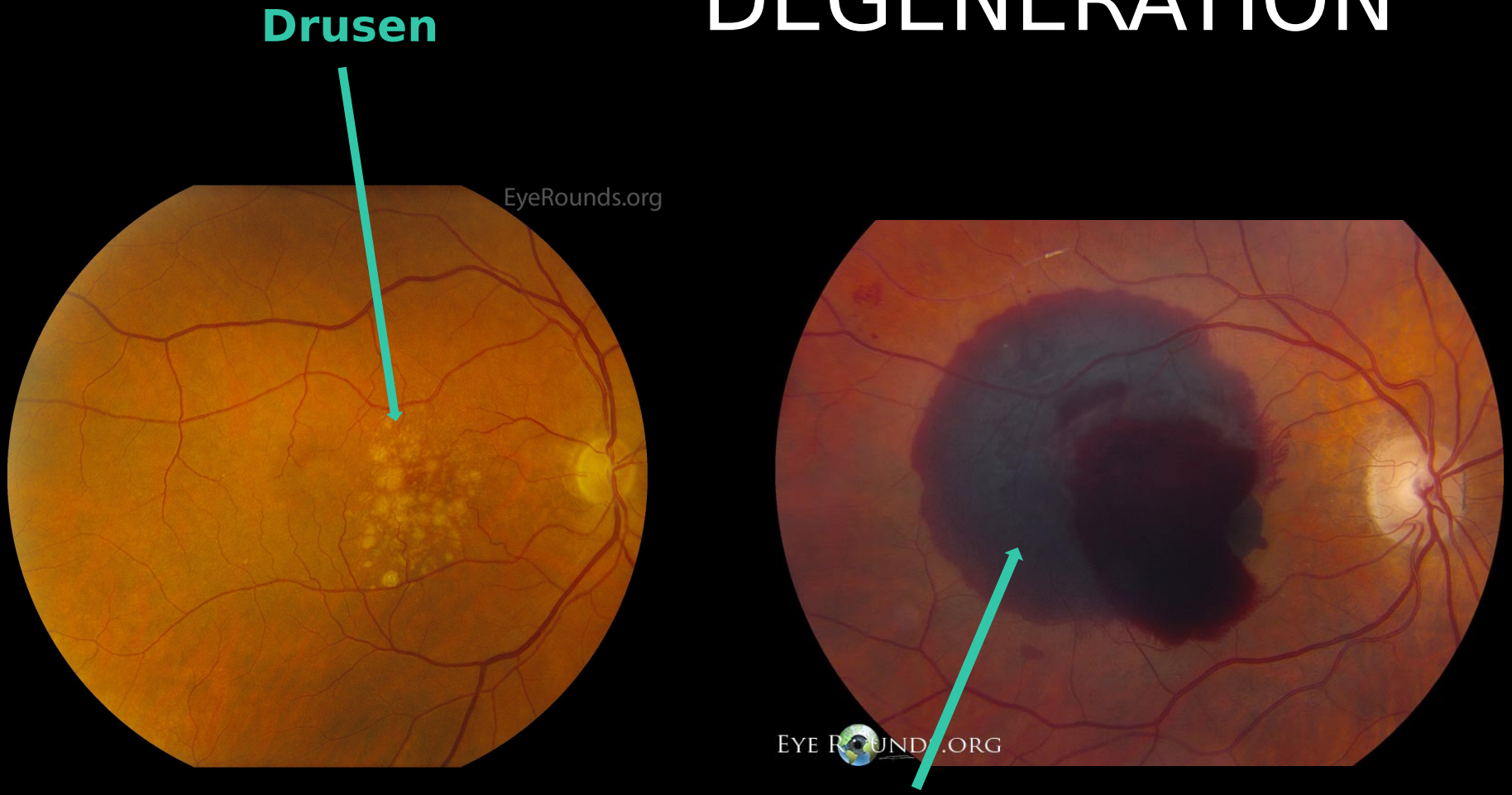
# CEREBROVASCULAR EVENT

## REFER TO PHYSICIAN, NEUROLOGIST OR STROKE UNIT

- Homonymous hemianopia less than 3-6 hours old: refer immediately – do full neuro exam
- Homonymous hemianopia  of longer duration: discuss with stroke unit / physician and refer as recommended



# ‘WET’ MACULAR DEGENERATION



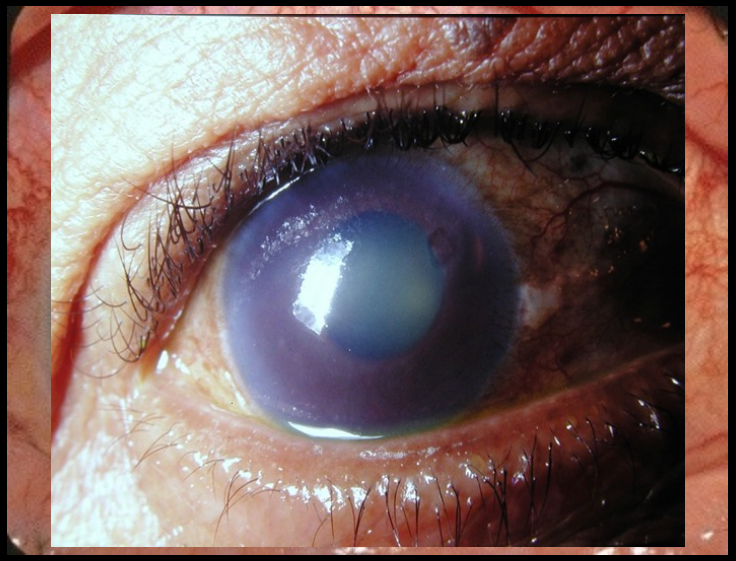

**Sudden visual loss due to haemorrhage - refer**

# SUDDEN PAINFUL VISUAL LOSS

# ACUTE GLAUCOMA

**Painful red eye**
**Headache**
**+/- Nausea & vomiting**

**May have noticed ‘halos around lights’ preceding this event**
**This is due to corneal oedema**



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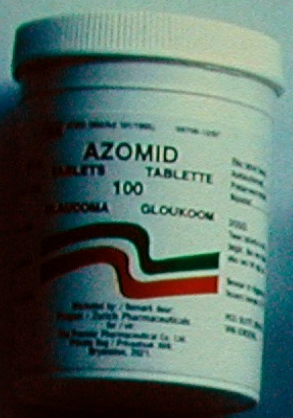
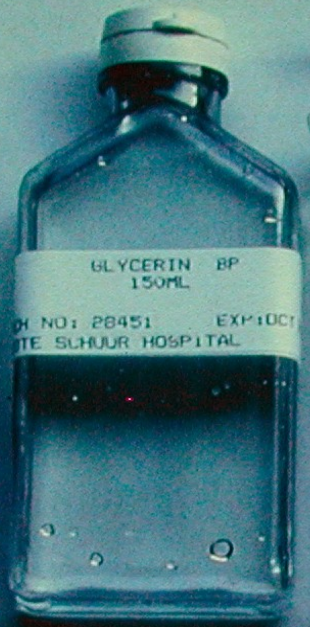
**Corneal haze**
**Mid-dilated, non-reactive pupil**
**RAPD+**

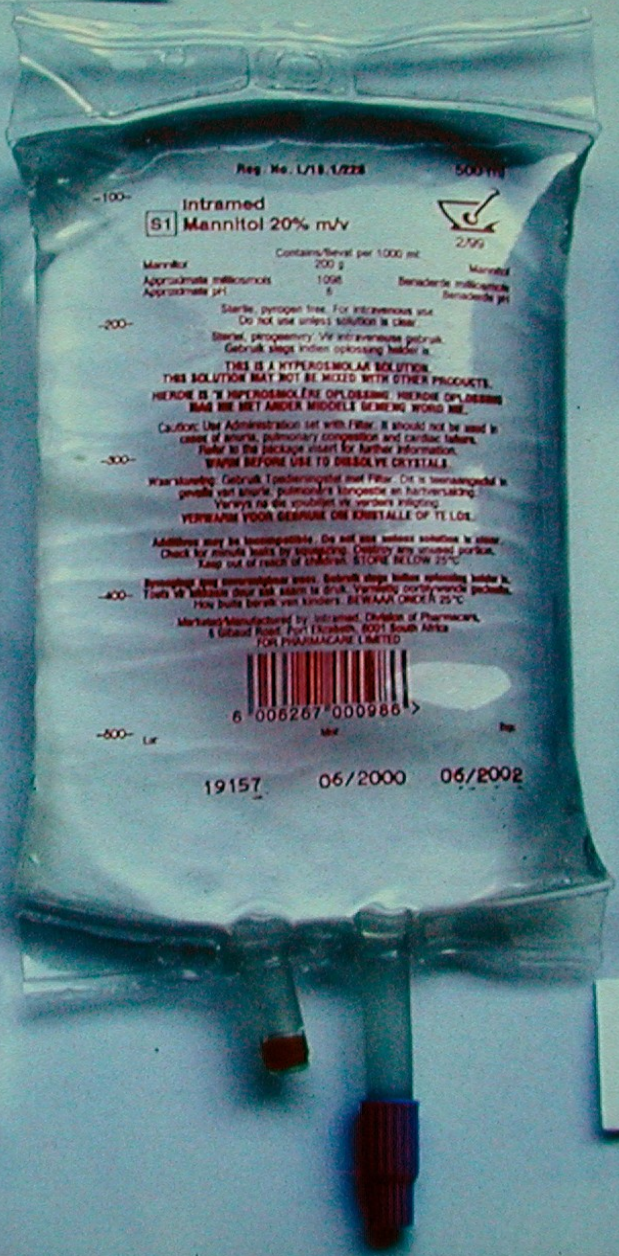
# TREATMENT OF ACUTE ANGLE CLOSURE GLAUCOMA

- Anti-emetic / analgesia
- Acetazolamide (give 500mg po) and glaucoma eyedrop if available (e.g. levobunolol - one drop)
- Refer immediately
- Further management by ophthalmologist:
  - Glycerol PO or mannitol IV to dehydrate the eye osmotically
  - Other ocular pressure reducing eyedrops
  - Pilocarpine to constrict the pupil once the pressure has come down
  - A laser peripheral iridotomy
  - Prevention strategies for other eye

## Treating Acute Angle closure glaucoma:





Intramed
S1 Mannitol 20% m/v
Contains/Bevat per 1000 ml
Mannitol
200 g
Sterile, pyrogen free. For intravenous use.
Do not use unless solution is clear.
THIS IS A HYPEROSMOLAR SOLUTION.
THIS SOLUTION MAY NOT BE MIXED WITH OTHER PRODUCTS.
Caution: Use Administration set with Filter. It should not be used in cases of anuria, pulmonary congestion and cardiac failure.
Refer to the package insert for further information.
WARM BEFORE USE TO DISSOLVE CRYSTALS.
VERWARM VOOR GEBRUIK OM KRISTALLE OP TE LOS.
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Betagan

Diamox

Glycerol
(or Manitol)

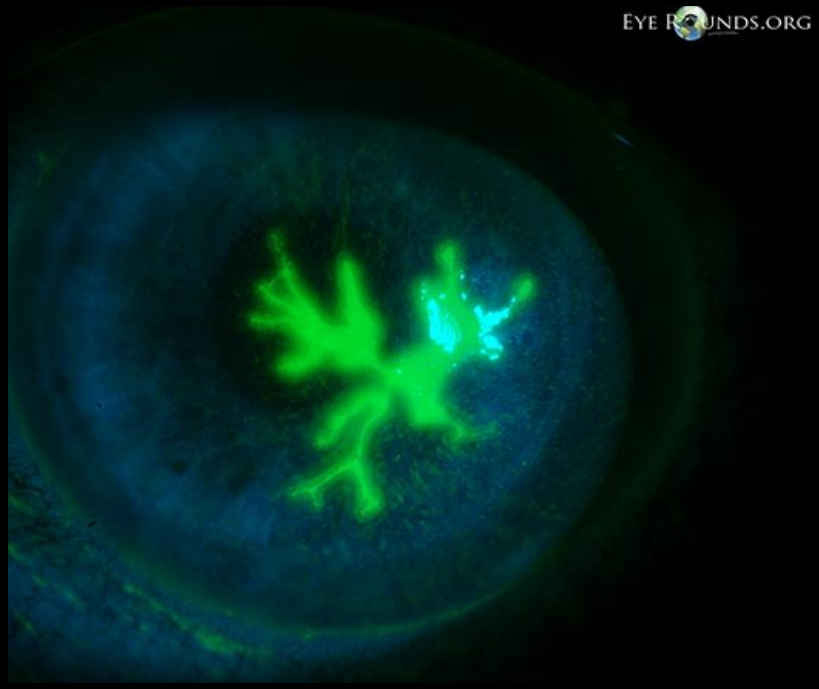
(Pilocarpine)

# INFECTIVE KERATITIS

**Bacterial**

**Notice the hypopyon**
**Always pull the lower eyelid down**

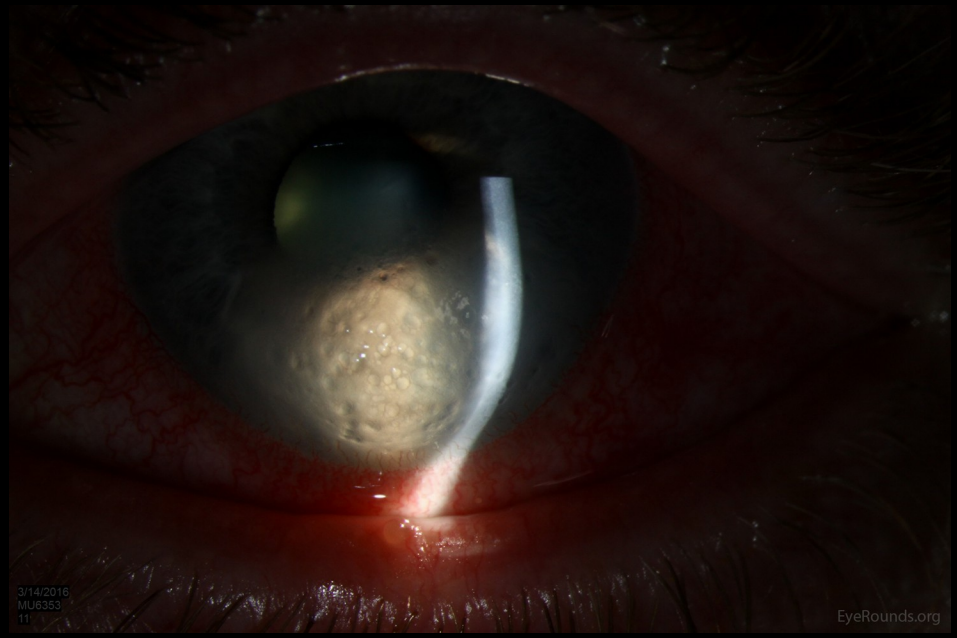
**Viral**




**Herpes simplex (fluorescein)**

# CORNEAL HYDROPS

**Notice conical shape**




**Most often due to keratoconus**

# ENDOPHTHALMITIS

**No keratitis but still hypopyon**

**Severe hypopyon could ‘hide’ keratitis – use fluorescein**

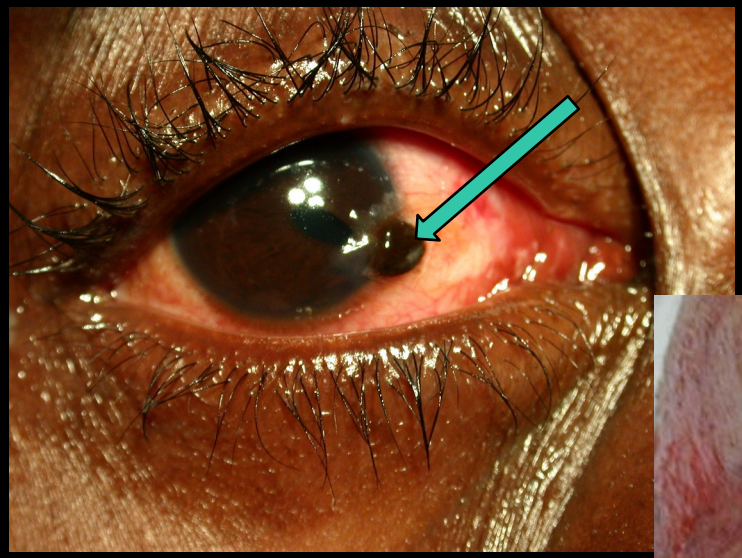
# MANAGEMENT OF ENDOPHTHALMITIS

- Urgent referral
- After ocular surgery or trauma – **exogenous**
- No ocular surgery or trauma – **endogenous**
  - Needs urgent medical workup and management of septicaemia
- Ophthalmology immediate management:
  - Vitreous sample and intravitreal antibiotics

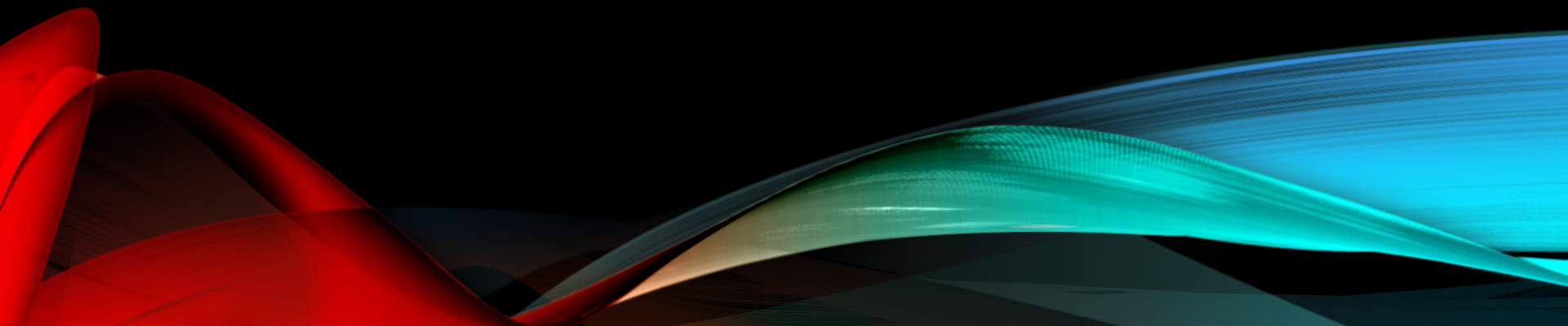
# PENETRATING TRAUMA
(SEE TRAUMA LECTURE)

**Iris prolapse**

**Do NOT try and remove this with a cotton bud!**



# OTHER IMPORTANT CONDITIONS



# ACUTE ISOLATED 3RD CN PALSY

**This case is due to a posterior communicating artery aneurysm compressing the 3rd nerve**

**Note the pupils (anisocoria) – pupil involved = compressive (surgical)**

# CHEMICAL INJURY

- Local anaesthetic eyedrops
- Evert lids and sweep any solid particles out of the fornices with a cotton bud
- Irrigate with normal saline for at least 30 minutes
- Test the pH with indicator from urine dipstick

YOU are the person
who is going to save the
patient from permanent
blindness

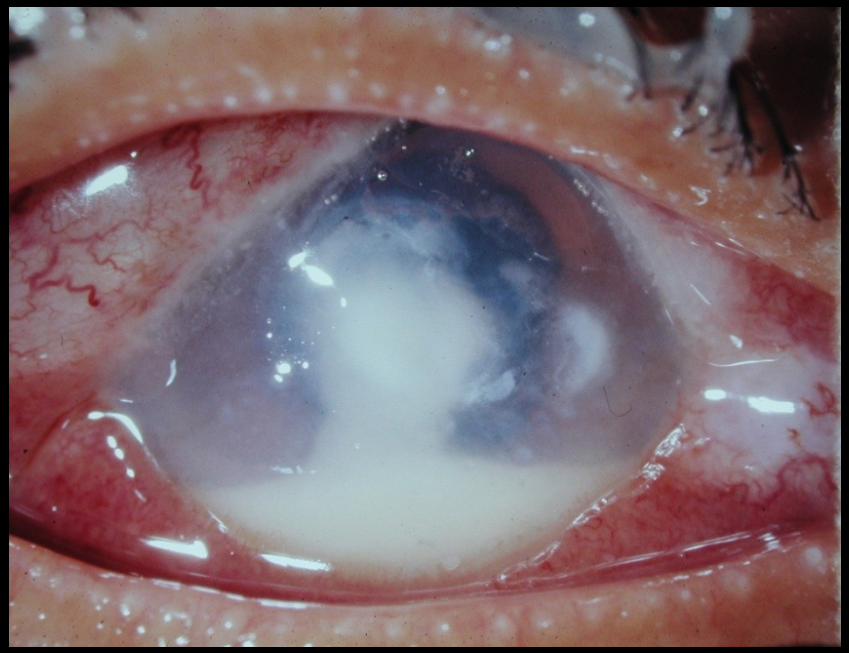
# TYPE OF CHEMICAL AND SEVERITY OF INJURY

- **Alkaline injuries are the worst** because:
  - they saponify the cornea and penetrate into the eye, destroying the trabecular meshwork, lens , retina etc.
- Ammonia penetrates the intact cornea in <30 seconds!

- **Acid injuries penetrate less easily** because:
  - acid coagulates proteins creating a barrier to further entry
- Sulphuric acid from exploding car batteries causes chemical and thermal burns
- Hydrofluoric acid can penetrate the eye

# GONOCOCCAL CONJUNCTIVITIS AND KERATITIS

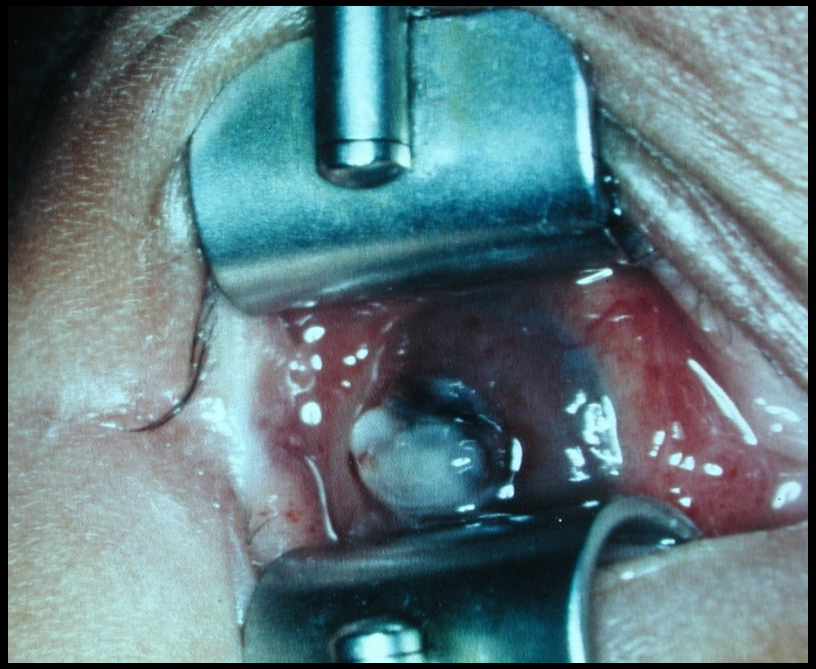
Presents with frothy purulent conjunctivitis (+/- history of washing eye with urine)



Can penetrate intact cornea to cause keratitis

# MANAGEMENT OF GONOCOCCAL EYE INFECTIONS

Perforated gonococcal keratitis



- Swab for MC&S
- Saline irrigation as required
- Ceftriaxone IMI stat and start hourly eyedrop antibiotic (e.g. Ciprofloxacin)
- Oral Azithromycin
- Refer to ophthalmology

# ORBITAL CELLULITIS

Orbital cellulitis caused by traumatic frontal sinusitis

Orbital cellulitis is usually caused by **sinus infection**

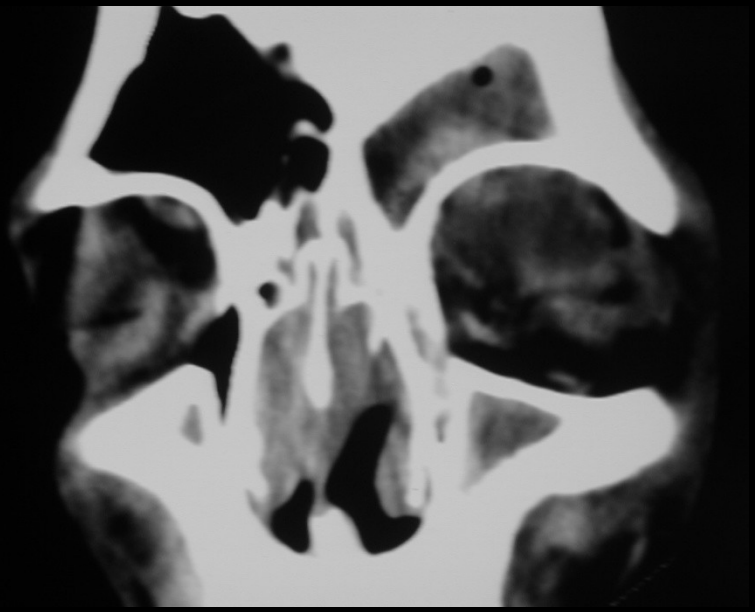
An ENT emergency

Can progress rapidly to cerebral abscess if not drained

# ORBITAL CELLULITIS VS PRESEPTAL CELLULITIS

| **Orbital cellulitis** (compartment syndrome of the orbit) | **Preseptal cellulitis** (no infection of the orbit) |
|---|---|
| • Lid swelling making it difficult to see the eye | • Lid swelling making it difficult to see the eye |
| • Vision may be difficult to test accurately – expect visual loss | • Vision may be difficult to test accurately – expect good vision |
| • Proptosis | • No proptosis |
| • Conjunctival injection and chemosis | • No chemosis |
| • Restricted eye movements | • No restricted eye movements |
| • RAPD + | • No RAPD |
| • Inpatient management | • Outpatient management – oral antibiotics |

# MANAGEMENT OF ORBITAL CELLULITIS



CT scan showing pus in the frontal and maxillary sinus

- Admission and intravenous antibiotics
- Urgent CT scan and refer to ENT for drainage of sinuses
- Ophthalmic evaluation at baseline and follow-up
- If sinuses are clear refer to ophthalmologist (rare)